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TECHNOLOGISTS OF SOUTH AFRICA

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NOTICE TO CONTRIBUTORS

All contributions are to be addressed to:—The Editor, The South African Journal of Medical Laboratory Technology, Room 213, Dept. of Pathology, Medical School, Umbilo Road, Durban.

Contributions may be written in English or Afrikaans, and should preferably be typed in double-spacing on foolscap sheets on one side of the paper only.

Figures should be drawn in Indian ink, and all figures and tables should be labelled as such (e.g Figure 1, Table 1, etc.).

Authors should make adequate references to previous works on their subjects. These should be set out as follows:—Author's surname and initials of Christian names; the year of publication (in parentheses); the name of the journal, which should be abbreviated according to the World List of Scientific Periodicals (see below); the volume number (underlined); and the first page reference.

Example:—Moron, I. B. (1960). *J. unsuccess. Med.*, **20**, 99. References to books should give the author's name and initials, the year of publication, title of book, name of publisher, and town in which published.

References should be arranged in alphabetical order of the authors' surnames. If more than one work by the same author is listed, these should appear in chronological order.

Technologists are reminded that regulations demand that all original articles of a technical or scientific nature must be approved by the heads of their departments before being submitted for publication.

Title abbreviations according to World List of Scientific periodicals

All nouns commence with capital letters, and adjectives small letters. Articles, conjunctions and prepositions are omitted.

Examples:—

J. Amer. med. Ass.	*S. Afr. J. clin. Sci.*
Lancet	*Stain Tech.*
Amer. J. clin. Path.	*J. Bact.*

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Alle selfstandige naamwoorde moet begin met hoofletters en byvoeglike naamwoorde met klein letters. Artikels, verbindings, en voorsetsels word uitgelaat.

Voorbeelde:—

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Lancet	*Stain Tech.*
Amer. J. clin. Path.	*J. Bact.*

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CURRENT AFFAIRS

EDITORIAL

IN THIS ISSUE, following the publication of the amended rules in June, we publish the syllabuses for the courses as required by the regulations.

We anticipate a fair amount of criticism will be levelled at these syllabuses particularly from all those who feel that they should have been consulted before finality was reached on any particular syllabus.

The truth of the matter is that discussions and negotiations have been going on for so long, and so many consulations have taken place that there was grave danger of meetings *ad nauseum* and of discussion for the sake of discussion. A start has now been made. Regulations and accompanying syllabuses of training are available to all. There will be teething troubles, no doubt, but we urge everyone—students, lecturers and employers to give the scheme a fair trial before criticising.

Talk of discussion leads naturally to the Special Committee for Medical Technology and its first meeting. It is obvious that the ideals of medical technologists have been shattered by the composition of the committee. Only one third of the membership of the committee, which will deal with all matters pertaining to medical technologists, is from the profession of medical technology. Previously in this journal we have made a plea for a reasonable say in our own welfare but our words have lain before blind eyes.

The new committee is "advisory" in character and it is true that a minority of opinion may be recorded during its deliberations and placed before the South African Medical and Dental Council and/or one of its sub-committees but, as the Department of Education, Arts and Science prepares to take over the administration of training courses, the confining bands around medical technology are in no way loosened.

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*EXFOLIATIVE CYTOLOGY

S. KLEMPMAN, M.B., B.CH.
Pathology Department
South African Institute for Medical Research

THE FIRST COURSE in exfoliative cytology in South Africa is at present being conducted by the S.A.I.M.R., Johannesburg, under the auspices of the National Cancer Association of South Africa. Students were selected from the medical technologists in the main centres of the Union to be trained in Cytotechnology. After completing their training they will return to practise in their respective laboratories.

The course takes six months during which all aspects and applications of the science are covered. The main part of the training is directed towards the use of exfoliative cytology in the detection and diagnosis of cancer by the study of secretions of the female genital tract, pulmonary tract, gastro-intestinal tract, breast, urinary tract, effusions pleural and abdominal and tumor aspirates. Lectures and demonstrations on direct tumor imprints, cancer cells in blood, bone marrow, cerebrospinal fluid and smears of cerebral tissue are included, but in these fields specialized training is essential.

The students are taught to recognize cellular atypias due to causes other than malignancy, e.g., inflammations, as well as to note the presence of Trichomonas organisms, monilia fungi and foreign bodies such as asbestos bodies in sputum. Tuition is also given in the hormonal evaluation of vaginal smears, nuclear sex determination in buccal smears and the cytology of direct smears from certain skin lesions both neoplastic and otherwise (Tzank test). To the best of our knowledge this is the only course which has incorporated all these applications of cytology.

Comprehensive teaching is effected by means of lectures, illustrated by projected transparencies, screening and interpretation of prepared slides under supervision and practical tutorials for identification of selected individual cells ("spot sessions"). Preparations of smears and various staining techniques are demonstrated and then practised by each student.

Instruction is also given in the efficient organization of the laboratory and the maintenance of accurate records.

Finally examinations will be held and the cytotechnologists issued with certificates.

As an experiment, this course is proving highly successful. We sincerely hope that these students will propogate the use of exfoliative cytology both for routine and research purposes in their own centres and encourage others to follow in their footsteps.

* Received for publication 29th August, 1960.

OBITUARY

PAUL ROUX

THE death of Paul Roux has robbed the Society of one of its founder members and it is with the greatest regret that we record his passing. His interest in the Society and in the welfare of Medical Technologists was no fleeting thing and all those who knew him regarded him as a friend. His colleagues on the Council of the Society will miss him. (Edit.)

PAUL ROUX

MEDICAL TECHNOLOGY recently lost one of its outstanding figures by the untimely passing away of Mr. Paul Roux. Mr. Roux joined the Technical Staff of the South African Institute for Medical Research 43 years ago as what was then termed an apprentice learner. He very soon became a key member in the small team of laboratory workers and concentrated mainly on the microbiological aspects of Medical Technology.

Mr. Roux was seconded to the Natal Pathological Services for a period of one year and when the Institute decided to open a Branch Laboratory in Port Elizabeth, he was given the important task of organising the Laboratory there. He later returned to Johannesburg, being placed in charge of the Bacteriological Department of the Central organisation.

Mr. Roux obtained a Bachelor of Arts degree as an extra-mural student at the University of the Witwatersrand and later a Master's Degree in Science by virtue of the scientific work he carried out in the Institute.

I would like to pay tribute to the memory of Paul Roux, however, not as an eminently practical scientist, but as a friend. He was a good friend to many people, from the endless line of junior medical technologists who were placed under his personal care in the Bacteriology Department, to his contemporaries in the Service. Paul was father confessor to the younger people, always willing to give a few moments of his valuable time to anyone in need and always with a keen sense of humour and a most remarkable flair for maintaining the balance of things. Paul could not suffer inefficiency and his firm control over his staff was one of the major factors responsible for building up the Department. His unique personality and capabilities made his nick-name in the Institute logical and not disrespectful—Papa Roux.

Paul loved his physical exercise. As a young man he played tennis and enjoyed his swim whenever possible. In later years he became an ardent bowler.

Paul Roux's work as a scientist will be carried on but his place as a friend will remain vacant.

J. A. BRANDT

SYLLABUSES

CHEMISTRY AND PHYSICS

1. CHEMISTRY

"Elementary Chemistry". Littler.
"Introduction to Practical Organic Chemistry". Mann & Saunders.

(*a*) *Inorganic and Physical Chemistry*

Chemical elements and the atomic theory.

Chemical compounds.
Valence and chemical formulae.
Chemical equations.
Gas laws. The gram molecular weight and gram molecular volume.
Oxygen and hydrogen.
Oxides, acids, bases and salts.
Systematic naming of compounds.
Chemistry of water.
Introduction to the chemistry of the halogens; sulphur; phosphorus; carbon and nitrogen.
Solutions.
Ionisation and the ionic theory.
Application of the ionic theory to neutralisation of acids and bases and precipitation reactions.
Indicators and their uses in the titration of acids and bases.

Practical

The analytical balance, its care and use.
Experiments with oxygen and oxides.
Experiments with hydroxides.
Experiments with water.
Experiments illustrating the electrochemical series.
Acids and alkalis.
Preparations of salts.
Experiments with halogens.
Experiments with sulphur.
Experiments with compounds of nitrogen.
The carbonates and bicarbonates.
Volumetric analysis.

(*b*) *Organic Chemistry*

The nature of organic compounds.
Linkages between atoms in organic compounds.
Classification of organic compounds.
The basic structure, representative examples, properties and uses of the following classes of organic compounds:—
Hydrogen compounds; their Halogen derivatives; Ethers; Alcohols;
Aldehydes and Ketones; Organic acids, salts and esters.

Practical

Tests for alcohols, methyl and ethyl.
Ketones, acetone.
Amines.
Carbohydrates (*a*) reducing
(*b*) non-reducing.
Simple organic acids.

2. PHYSICS

"Elementary Physics". Stead.

Units of measurements (length and volume): cc.; ml., Kg., Litre, erg and dyne.

Force

Momentum, acceleration, the balance, the lever.

Energy

Kinetic energy. Potential energy, work and power.

Density

Specific Gravity: Gases, liquids and solids.

Gas Laws

Heat

Units.
Convection, conduction and radiation.
Thermometers.
Solutions—supersaturation, crystallisation.
Expansion—linear, cubical, real and apparent.

Change of State

Melting, boiling, evaporation, latent heat of fusion and vaporisation.
Distillation.
Sublimation.

Electricity

Current, voltage and resistance.
Direct and alternating current.
Heating effect of a current.
Electrolysis—cataphoresis.
The galvanometer, ammeter and potentiometer.

Light

Laws of reflection and refraction.
Plane and concave mirrors.
Concave and convex lenses.
Focal length, image.
Polarised light.
Spectrum and the theory of colour.
Spectroscope and polariscope.
Microscope (in detail).

As far as possible, theoretical course should be amplified with practical classes.

PHYSIOLOGY AND ANATOMY

"Anatomy and Physiology for Nurses". Sears.

1. *Protoplasm*—The cell.
2. *Blood*—lymph and tissue fluids.
   - (*a*) Composition of blood.
   - (*b*) Blood cells and their development.
3. *Spleen*—reticulo-endothelial system.
4. *Circulation*—general description.
5. *Respiration*
   - (*a*) General description.
   - (*b*) Mechanics of respiration.
   - (*c*) Chemistry of respiration.
   - (*d*) Functions of respiration.
   - (*e*) Vital capacity, etc.
6. *Digestion*
   - (*a*) General description of the alimentary tract.
   - (*b*) Enzymes.
   - (*c*) Salivary glands; composition and function of saliva.
   - (*d*) Composition and secretion of gastric juice and digestion in the stomach.
   - (*e*) Composition and secretion of pancreatic and intestinal juice and digestion in the small intestine.
   - (*f*) Faeces.
7. *Liver and Gallbladder*
   - (*a*) General description.
   - (*b*) Functions.
   - (*c*) Composition, secretion and metabolism of bile.
   - (*d*) Liver function tests.
8. *Kidneys and Urinary System*
   - (*a*) General description.
   - (*b*) Renal function.
   - (*c*) Composition and formation of urine.
   - (*d*) Urine analysis.
9. *Metabolism and Nutrition.*
   - (*a*) Calorific requirements.
   - (*b*) Basal metabolic rate.
   - (*c*) Protein metabolism
   - (*d*) Carbohydrate metabolism.
   - (*e*) Lipoid metabolism.
   - (*f*) Vitamin and mineral salt metabolism.
10. *Endocrine Glands*
    - (*a*) General description.
    - (*b*) Functions.

11. *Reproductive System*
    (*a*) General description, male and female.
    (*b*) Reproduction, ovulation and fertilisation.
12. *Nerve and Muscle*
13. *Central Nervous system*
    (*a*) General description Brain and spinal cord.
    (*b*) Manufacture and composition of cerebrospinal fluid.
14. *Autonomic Nervous System*
15. *Special Senses*—Eye, ear, taste, smell, skin

INSTRUMENTATION

A detailed, working knowledge of:—
Incubators.
Sterilisers, the autoclave, etc.
Ovens and baths.
Stills.
Centrifuges.
Balance.
Gas generating apparatus.
Cylinder code—manufactured gases.
Colorimeters.
Photometers.
Polarimeters.
Refrigeration.
Vacuum equipment.

GENERAL LABORATORY PROCEDURE

"An Introduction to Medical Laboratory Technology". Baker, Silverton, Luckcock.

1. Safety precautions in the laboratory.
2. Types and purposes of laboratory glassware.
3. Cleaning, sterilisation and storage of new, used and infected glassware.
4. Cleaning and sterilisation of syringes, etc.
5. Sterilisation and disposal of infected material.
6. Storage of dangerous compounds, gases, etc.
7. Filters.
8. Care and handling of laboratory animals.
9. Preparation of solutions, stains and reagents to a given formula.
10. Preparation of simple culture media. pH, dispensing and sterilisation.
11. Common routine laboratory methods:— Urinalysis; Simple agglutination tests.

12. White cell counts, differential counts, E.S.R., P.C.V., Hb., ABO and Rh groups, Compatibility tests, Blood urea, blood sugar, C.S.F. chemistry, etc.
    Routine bacteriological examination for blood cultures;
    C.S.F., Faeces;
    Fluids, Sputum,
    Throat, Nose and Wound swabs;
    Gastric lavage; Urine;
    Routine sensitivity testing;
    Coagulase tests, etc.
    Introduction to Histopathological technique—Fixation.
13. Routine staining methods: Gram, Ziehl-Neelsen, Leishman, May Grunewald, Haematoxylin and eosin.
14. Maintenance of laboratory records, stores, etc.

SYLLABUS, ETC, FOR THE SUBJECT CLINICAL PATHOLOGY IN THE FINAL EXAMINATIONS FOR MEDICAL TECHNOLOGISTS

CLINICAL PATHOLOGY

SECTION A: MICROBIOLOGY

1. Historical outline.
2. Antibacterial substances and Antibiotics.
3. Antigen—antibody reactions.
4. Methods of obtaining cultures.
5. Morphology and identification of Bacteria responsible for infections in man.
6. Infection, resistance, immunity, anaphylaxis.
7. Application of bacteriology to medicine, hygiene and public health.
8. Serology.
9. Human Parasitology and Mycology.
10. Equipment, knowledge and maintenance.
11. Vaccines.
12. Care of animals and animal rooms.
13. Bacteriologic control of central sterilizing departments, e.g., syringe services, sterile solutions as used in hospitals.
14. Detailed knowlege of specimen collection.

SECTION B: CHEMICAL PATHOLOGY

1. Special apparatus—care of.
2. Renal function tests.
3. Urine in health and disease.
4. Basal Metabolic Rates.
5. Routine Liver Function Tests.

6. Spectroscopy.
7. Routine examination of blood and body fluids.
8. Chemistry of Gastrointestinal contents.
9. Mathematical aids used for calculation of biochemical problems.

SECTION C: HAEMATOLOGY

1. Collection and Preservation of Blood Samples.
2. Standard laboratory methods for use in investigation of Blood Diseases.
3. Blood grouping, RH Typing, Compatibility Tests and Antibody Titration.
4. Recognition of blood parasites of man.

SYLLABUS, ETC, FOR THE SUBJECT MICROBIOLOBY IN THE FINAL EXAMINATION FOR MEDICAL TECHNOLOGISTS

N.B.—The Technologist is expected to possess only a broad theoretical knowledge of the science, but a detailed knowledge of its practical application in respect to those standard routine methods which are employed in general medical microbiological diagnostic laboratories.

1. GENERAL
   (1) A brief account of the history of medical microbiology.
   (2) General laboratory discipline and the prevention and treatment of laboratory accidents.
   (3) The keeping of laboratory records.
   (4) The general care and maintenance of laboratory equipment and apparatus.
   (5) A general account of methods used in the prevention and control of infectious diseases in man.

2. BACTERIOLOGY
   A. *Theoretical*
      (1) The nature of bacteria—their morphology and physiology.
      (2) The classification of bacteria.
      (3) The properties of bacteria which enable them to cause disease.
      (4) The nature of infectious disease and the methods whereby such disease is spread.
      (5) The response of the host to the parasite with special reference to the nature and principles of immunity and to the nature of allergy.

(6) A brief account of the nature and use of antiseptics, antibacterial chemotherapeutic agents and antibiotics.

(7) A systematic study of the bacteria which are parasitic to man with special reference to routine diagnostic methods and to the epidemiology of the diseases caused by the pathogenic bacteria.

B. *Practical*

(1) Methods for the staining of bacteria and the preparation of staining reagents.

(2) The microscopic examination of bacteria.

(3) The preparation and sterilisation of glassware.

(4) The preparation of culture media and of solutions which are commonly used in routine diagnostic microbiological laboratories.

(5) The cultivation of bacteria.

(6) Routine methods employed in the identification of bacteria pathogenic to man.

(7) Routine serological diagnostic methods.

(8) The care of small laboratory animals, their inoculation and the conduct of necropsies on them.

(9) Sanitary bacteriological examinations, e.g., the routine bacteriological examination of water, milk, foodstuffs, disinfectants and antiseptics.

(10) Sterility testing.

(11) The preparation of vaccines and of diagnostic antigens and antisera.

(12) The assay of antibiotics and tests for the sensitivity of bacteria to antibacterial chemotherapeutic agents and antibiotics.

(13) The selection, collection and forwarding of specimens.

(14) The preservation of bacterial cultures.

3. PARASITOLOGY

A. *Theoretical*

A brief account of the parasites causing disease in man in South Africa, of their life histories and of the diseases caused by them.

B. *Practical*

The laboratory methods commonly employed for the routine diagnosis of parasitic diseases of man.

4. MYCOLOGY

A. *Theoretical*

A brief account of the more important fungal diseases of man and of the fungi which cause these diseases.

B. *Practical*

The laboratory methods commonly employed in the routine diagnosis of fungal diseases.

5. VIROLOGY

A. *Theoretical*

A brief account of viruses and rickettsia and of the more important diseases caused by them.

B. *Practical*

Laboratory methods routinely employed in the diagnosis of rickettsial diseases and an introduction to the basic laboratory methods employed in the diagnosis of viral diseases.

SYLLABUS, ETC., FOR THE SUBJECT HISTOPATHOLOGY IN THE FINAL EXAMINATION FOR MEDICAL TECHNOLOGISTS

SYLLABUS

HISTO-PATHOLOGICAL TECHNIQUE

(Basic Training)

Theory

Principles of fixation, dehydration and wax embedding. Paraffin wax cutting. Microtomes and knives (maintenance, care, use and sharpening of knives).

Staining: General principles; haematoxylin and eosin, connective tissue stains, P.A.H. P.A.S., elastic tissue stains, reticulin stains, W.S. stain, bacterial stains, pigments. Frozen Section techniques—principles and uses. Decalcification of tissues.

Museum preparations.

Exfoliative cytology.

Practical

Students will be required to fix, process, dehydrate and embed various tissues. Then cut paraffin wax section of the processed blocks. They must be able to stain by the following procedures:

H. & E.: Connective tissue stains, P.A.H., P.A.S., elastic fibres, reticulin, iron and other pigments, Z.N., Gram stain and one of the Romanowsky stains, F/S on tissue for fat and as urgent diagnostic procedure. Decalcification.

(*Advanced Training*)

Celloidin and other specialised methods of embedding.
Whole organ section techniques.
Preparation of staining reagents.
Course in chemistry as related to staining procedures.
Histochemistry techniques.
Elementary techniques.
Elementary histology and histopathology.
Photo-micrography.

SYLLABUS, ETC, FOR TNE SUBJECT CHEMICAL PATHOLOGY IN THE FINAL EXAMINATION FOR MEDICAL TECHNOLOGISTS

CHEMICAL PATHOLOGY (Basic Training)

General Introduction

(Revision), Basic chemical laws, gas laws, atomic and molecular theory, vapour density, symbols, formulae, valency. Methods of volumetric and gravimetric analysis; their calculations. Measuring, weighing, crystallisation, distillation, drying, incineration, precipitation, etc.

Filters and types of filter paper.

Ionic theory; pH and its estimation; buffers.

Colorimetry; visual and photo-electric colorimeters; light filters, calculation of results.

Spectroscopy; direct and reversion spectroscopes.

Introduction to organic chemistry with special reference to substances of a biochemical nature.

Practical Work

A practical knowledge of the methods used for the determination of:

Blood: Bilirubrin, calcium, carbon monoxide, chloride, cholesterol, creatinine, diastase, phosphatase, N.P.N., phosphate, potassium, protein, sodium, sugar, urea, uric acid. Liver function tests (Thymol turbidity etc.) Abnormal pigments.

Urine: Routine analysis including microscopical examination; detection of abnormal constituents; quantitative estimation of chloride, creatine, creatinine, diastase, protein, sugar, urea, uric acid. Abnormal pigments. Urea concentration and clearance tests and their calculation.

Faeces: Tests for blood and bile derivatives; fat analysis.

Gastric Analysis:

C.S.F.: Estimation of chloride, globulin, protein, sugar, urea, Lange curve.

Pregnancy tests: Xenopus test.
Basal metabolism tests: Calculation of B.M.R.

(Advanced Training)

CHEMICAL PATHOLOGY SYLLABUS (Cont.)

Courses in inorganic and organic chemistry, with special reference to carbohydrates, proteins and fats.
Standardisation and control methods in biochemistry.
Principles and practice of chromatography and electrophoresis.
Steroid chemistry and determinations.
Protein Bound Iodine.
Biological and chemical determinations of catecholamines.
Determination of metals, e.g., Cu, Pb, Mg, Fe in biological fluids.
Quantitative fat estimations.
Enzyme chemistry.
Principles and Practice of instrumentation.
Principles of radioisotope techniques.

SYLLABUS, ETC., FOR THE SUBJECT HAEMATOLOGY IN THE FINAL EXAMINATION FOR MEDICAL TECHNOLOGISTS

SYLLABUS

HAEMATOLOGY

THEORETICAL

1. The normal morphology of the blood cells and platelets with some normal values. Staining techniques.
2. The origin, development, function and fate of the blood cells and platelets.
3. Abnormalities in Haemoglobin.
4. Abnormalities in red cells.
5. Abnormalities in white cells.
6. Study of the Plasma (Normals and abnormalities).
   (1) Sedimentation Rate.
   (2) Agglutination reactions and haemolytic reaction.
      (1) Blood groups and compatibility.
      (2) Donath-Landsteiner (Ham.).
      (3) Coombs Test.
      (4) Paul Bunnell—cold agglutination, etc.
   (3) Other Serological reactions—L. E. phenomenon.
   (4) The mechanism of coagulation and anti-coagulants.
7. Parasites occuring in Blood.

SYLLABUS

HAEMATOLOGY

PRACTICAL

1. Pipettes and pipetting. The colorimeter; the counting chamber.
2. Methods of estimating haemoglobin, and the methods used to express haemoglobin values.
   (1) Acid—Alkaline haematin.
   (2) Oxyhaemoglobin.
   (3) Oxygen content.
   (4) Carboxyhaemoglobin.
   (5) Iron estimation.
   (6) Methods of checking colorimeters for haemoglobin estimation.
3. The red and white cell counting techniques.
4. The staining of films, sedimentation rate, and P.V.C.
5. The Differential count, and Red cell morphology and Size; Platelet counting.
6. The staining of bone marrow; The marrow count—myelogram.
7. The L.E. preparation.
8. The Osmotic Resistance Test (Fragility).
9. The Sickling phenomenon.
10. The Blood groups and Rh and compatibility.
11. Practical coagulation technique.

SYLLABUS, ETC., FOR THE SUBJECT BLOOD TRANSFUSION TECHNOLOGY IN THE FINAL EXAMINATION FOR MEDICAL TECHNOLOGISTS

1. General immunological principles: antigens, antibodies, complement, agglutination, haemolysis, immunization.
2. Elementary genetics with particular reference to the inheritance of human blood factors.
3. Elementary biometrics.
4. Characteristics of red cell antigens: factors affecting reactions between red cell antigens and corresponding antibodies.
5. Non-specific agglutination: cold agglutinins; pan-agglutinins; pseudo-agglutination; auto-antibody effects.
6. Methods of blood grouping: titration of iso-antibodies.
7. ABO blood-groups; sub-groups of A.
8. Preparation and standardization of anti-A and anti-B sera; tests for specificity, avidity and titre.
9. Blood group substances in tissues—inhibition techniques with saliva and purified blood group substances.
10. Plant agglutinins, their characteristics and uses in blood group serology.

11. ABO groups in transfusion and pregnancy—detection of immune anti-A or B.
12. MNS blood group system—preparation of anti-sera in animals.
13. The Rhesus blood group system: genetics and clinical effects in transfusion and pregnancy.
14. Rhesus phenotyping.
15. Detection, identification and titration of Rhesus antibodies; tests in saline and with enzyme-treated cells. Preparation of reagents and high protein media.
16. The antiglobulin test—preparation, standardization and use.
17. Other blood group systems of importance in blood transfusion.
18. Absorption and elution of antibodies.
19. Donor screening for irregular antibodies, haemolysins and titre of iso-agglutinins.
20. Compatibility tests for transfusion.
21. Complications of blood transfusion: Reactions—haemolytic, pyrogenic, allergic circulatory, toxic, immunologic sensitization.
22. Investigation of transfusion reactions.
23. Ante-natal and post-natal serology. Serological diagnosis of haemolytic disease of newborn.
24. Investigation of haemolytic anaemias (immuno-haematology).
25. Tests for syphilis.
26. Haemoglobin and bilirubin determination. Preparation of copper sulphate solutions.
27. Technique of blood transfusion: collection of blood, donor care, labelling.
28. Blood bank organisation: general procedure, records, accommodation and equipment; blood storage and transportation.
29. Cleansing, assembly, preparation, sterilization and maintenance of blood transfusion equipment.
30. Pyrogens: character; method of detection; method of preparation of pyrogen-free solutions and equipment.
31. Preparation of packed cells.
32. Preparation of plasma—liquid and frozen.
33. Principles of plasma drying and fractionation.

SYLLABUS FOR THE SUBJECT VIROLOGY IN THE FINAL EXAMINATIONS FOR MEDICAL TECHNOLOGISTS

THEORETICAL:

1. Historical outline.
2. A brief description of the bacterial, animal and plant viruses and the lesions they produce.
3. The life cycles, reproduction and methods of study of bacteriophages.

4. The biological, physical and chemical properties of rickettsiae and viruses.
5. Growth and identification of viruses.
6. A brief account of the common virus diseases.

PRACTICAL:

1. Cultivation of viruses in:—
   (i) Embryonated eggs;
   (ii) Animals;
   (iii) Tissue culture.
2. Haemagglutination and complement fixation techniques.
3. Neutralization techniques.
4. Methods for the estimation of virus infectivity.
5. The preservation and maintenance of virus stocks.

SYLLABUS FOR THE SUBJECT PARASITOLOGY AND HELMINTHOLOGY IN THE FINAL EXAMINATIONS FOR MEDICAL TECHNOLOGISTS

Intermediate

Theoretical

A brief introduction to Biology.

Practical

Preparation of material for parasitological examination including concentration techniques. Identification of common helminth ova in stools and urine.

Final

Basic

Theoretical

Basic Principles of Parasitism.
Life Cycles of Parasites.

Practical

Identification of the protozoal parasites and the common adult and larval helminths of man. Preservation of parasitological material for further identification.

Advanced

Theoretical

Advanced Principles of Parasitism.
Basic Entomology.

Practical

Detailed identification of adults, larval forms, intermediate hosts and vectors.

Special methods, such as cultivation xenodiagnosis, preparation of antigens, etc.
Preparation of permanent specimens.

Suggested Reading

Basic

Animals Parasitic in Man. Geoffrey Lapage. Pelican Series.

Advanced

"Clinical Parasitology". Craig and Faust. Philadelphia: Lea & Febiger. "Introduction to Parasitology". Asa C. Chandler. London: Chapman & Hall. "Medical Entomology". John Matheson. London: Constable & Co.

THE SOUTH AFRICAN MEDICAL AND DENTAL COUNCIL

SPECIAL EXAMINATIONS

for

MEDICAL TECHNOLOGISTS

SPECIAL examinations for Medical Technologists who are not ordinarily registrable as such with the Council but who satisfy certain specified requirements, will be conducted by the Council towards the end of November, 1960. The examinations will be practical and oral and will cover work met with in routine laboratory procedures.

The examinations will be held at different centres, depending on the number of candidates; final arrangements will be announced at a later date.

Details of the requirements to be satisfied for admission to the examinations may be obtained from the Registrar of the Council, P.O. Box 205, Pretoria, with whom written applications for admission should be lodged not later than 21st October, 1960.

ABSTRACTS

BIO-CHEMISTRY

Use of the Control Chart in Clinical Chemistry. Author: Richard J. Henry, Bio-Science Research Foundation, 12318 Santa-Monica Blvd., Los Angeles. Source: *Clinical Chemistry*, Aug. 1959, Vol. 5, No. 4, pp. 309-319. Content: The accuracy and quality of laboratory results were improved; and an index on the state of control of each test was the result of the author's use of control charts for a ten year period.

A System of Microchemistry for the hospital laboratory designed for maintenance of a high standard of performance. Author: David Seligson, Grace-New-Haven Community Hospital, New Haven, Conn. Source:

Clinical Chemistry, Aug. 1959, Vol. 5 No. 5, pp. 320-334. Content: Discussion of equipment and methods using 0.1 to 0.2 ml. sample volumes for performance of urea, Cl, Na, K, CO_2, Ca, cholesterol, PO_4, phosphatase, creatinine, glucose, total protein, thymol and zinc turbidity tests.

A rapid micro-method for determining serum calcium. Serum (0.1 ml) is added to 0.25 N.NaOH and titrated with 0.2 per cent. disodium ethylenediaminetetra-acetic acid from a micrometer syringe under ultra-violet light with calcium as a fluorescent indicator. The effect of possible interfering substances is investigated and the method is compared with murexide titration and the Kramer-Tisdall technique and found to be satisfactory. Bett, I. M. & Fraser, G. P. (1959) *Clin. Chim. Acta.*, **4**, 346.

The control of accuracy in the laboratory. Proper performance of a test requires both the knowledge of the technical aspects of the procedure and also an understanding of its theoretical foundations. Checks on individual technologists' performances are desirable. Glassware is not consistently accurate. One hospital is quoted as having 20 per cent. blood sugar tubes unsatisfactory. White cell pipettes often vary widely. Standard solutions do not always remain unchanged even over short periods. Instruments have become more complicated, although appearing to be simple and push-button operated. Calculations should be doubly checked and a knowledge of mathematics is essential. Machines will usually give answers, but will not indicate if these are the correct answers. Leidler, Franz (1959) *Am. J. Med. Tech.*, **25**, 139.

Variation of pH of clinical samples as a source of error in enzyme determinations. Authors: Richard J. Henry and Neil Chiamori. *Clinical Chemistry*, Oct. 1959, Vol 5 No. 5, pp. 402-404. Variation of pH of urine and serum samples produces significant error. Prompt testing of specimens and inadequacies of the buffer systems to control pH are emphasized.

A practical method for the determination of Fibrinogen. Authors: Miriam Reiner and Helen L. Cheung. *Clinical Chemistry*, Oct. 1959, Vol. 5, No. 5, pp. 414-420. Method given in which thrombin converts fibrinogen to fibrin and this clot is hydrolyzed. Protein concentration measured by biuret reagent. Mean plasma normal was 295 ± 17 mg./100 ml. With low fibrinogen levels Lowry's phenol-biuret reagent is recommended.

MICRO-BIOLOGY

Faults and fallacies in Micro-biology. The Fourth Marjory Stephenson Lecture. This was delivered to the Society for General Micro-biology and shows how wrong conclusions have been drawn by the use of faulty techniques, often without adequate controls. Wilson, G. S. (1959), *J. Gen. Microbiol.*, **21**, 1.

NEWS RELEASE

American Society of Medical Technologists

"MEDICAL TECHNOLOGY has made giant strides during the past year, particularly in the area of advanced education", said Ruth I. Heinemann, 3436 Forty-seventh Avenue South Minneapolis, Minn., retiring president of the American Society of Medical Technologists, at closing sessions of the group's 28th Annual Convention. Speaking at the Ambassador Hotel, Miss Heinemann, who is associated with the Minnesota State Department of Health, said that universities and colleges are now awarding masters' degrees in medical technology, whereas they formerly required students to follow curricula resulting in the awarding of degrees in the other physical sciences. "The University of Minnesota has been a forerunner in bringing greater recognition to this, one of the youngest of the paramedical fields", said Miss Heinemann. "With other institutions of higher learning following suit, more young men and women will be encouraged to enter the teaching and teaching supervisory phases of this vital profession," she continued. The educational institutions are also preparing students for more responsible positions in hospitals, clinical laboratories, and research organizations. Miss Heinemann quoted Martin Ulan, administrator of Hackensach Hospital, Hackensack, N.J., who said that the chief medical technologist in the hospital of 1960 should have the status of laboratory administrator with full executive responsibility, compenstation and privileges.

Miss Heinemann presided at a six day series of conferences, workshops and seminars attended by approximately 1,700 medical technologists, pathologists, educators and physicians.

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